rounded lobes at each corner of said generally rectangular configuration and having rounded lobes on said sides between said first and second ends;

a lower surface for placement against the cervical vertebral bodies and an upper surface opposite to said lower surface;

a bi-concave curvature for conforming to the anterior aspect of the cervical spine in lordosis, said bi-concave curvature having a longitudinal concave curvature along the longitudinal axis of said plate and a transverse concave curvature along the transverse axis of said plate;

a plurality of bone screw receiving holes extending through said plate from said upper surface to said lower surface and having a reduced diameter portion near said lower surface, a respective one of said plurality of bone screw receiving holes located at each of said rounded lobes such that said plate has a first pair of said bone screw receiving holes located at said first end of said plate corresponding to a first of the adjacent vertebral bodies, a second pair of said bone screw receiving holes corresponding to a second of the adjacent vertebral bodies, and a third pair of said bone screw receiving holes corresponding to a third of the adjacent vertebral bodies; and

a plurality of locking elements each adapted to lock to said plate only one each a bone screw placed in said bone screw receiving holes, each of said plurality of locking elements coaxially engageable in a respective one of said bone screw receiving holes to lock one of the bone screws to said plate, each of said locking elements having a bottom surface and a top surface with a depression for engaging a tool used to lock and unlock said locking element to

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said plate, said bottom surface configured to fit over the bone screw and bear against the bone screw, each of said locking elements having an outer perimeter contacting at least a portion of the perimeter of a respective one of said bone screw receiving holes, said locking elements each having a through-hole passing through said top surface and said bottom surface, said through-hole having a central longitudinal axis coaxial with a central longitudinal axis of a respective one of said bone screw receiving holes.

285. (Twice Amended) The plate system of claim 282 in which said plate has a length longer than a width, and said longitudinal concave curvature has a radius of curvature greater than 15 cm and less than 25 cm.

286. (Twice Amended) The plate system of claim 282 in which said plate has a length longer than a width.

287. (Twice Amended) The plate system of claim 282 in which said transverse concave curvature has a radius of curvature in the order of approximately 16 mm to 21 mm.

538. (Amended) A plate system adapted for use in the anterior human cervical spine for contacting the anterior aspect of at least two cervical vertebral bodies, said plate system comprising:

a plate having a longitudinal axis and a length sufficient to span a disc space and overlap portions of at least two adjacent cervical vertebral bodies, said plate having a lower surface for placement against the vertebral bodies and an upper surface opposite said lower surface, said lower surface being concave along a substantial portion of the longitudinal axis of said plate;

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at least two bone screws each having a central longitudinal axis and being adapted to engage each of the at least two vertebral bodies, respectively, each of said bone screws having a leading end for insertion into the vertebral bodies and a trailing end opposite said leading end;

at least two bone screw receiving holes extending through said plate from said upper surface to said lower surface, each of said bone screw receiving holes having a central longitudinal axis and being adapted to receive one of said bone screws to attach said plate to the vertebral bodies, each of said bone screw receiving holes and said bone screws being configured to cooperate with each other to permit the central longitudinal axis of one of said bone screws to fixedly align with the central longitudinal axis of one of said bone screw receiving holes, at least a first of said bone screw receiving holes adapted to overlie a first of the vertebral bodies and at least a second of said bone screw receiving holes adapted to overlie a second of the vertebral bodies; and

a plurality of locking elements each adapted to lock to said plate only one each of said bone screws inserted into one each of said bone screw receiving holes, said locking elements each having a central longitudinal axis adapted to be substantially aligned with both the central longitudinal axis of said bone screw receiving hole and the central longitudinal axis of said bone screw when inserted in said bone screw receiving hole to retain said bone screw to said plate, said locking elements each having an outer perimeter contacting at least a portion of the perimeter of one of said bone screw receiving holes, said locking elements each having an upper surface, a lower surface opposite said upper surface, and

a through-hole passing through said upper surface and said lower surface, said through-hole having a central longitudinal axis coaxial with the central longitudinal axis of one of said bone screw receiving holes.

543. (Amended) The plate system of claim 542, wherein said access opening is a slot.

545. (Amended) The plate system of claim 538, wherein at least one of said locking elements is generally circular and the central longitudinal axis of said locking element is the rotational axis of said locking element, the rotational axis being coaxial to the central longitudinal axis of one of said bone screw receiving holes when said locking element is inserted in said bone screw receiving hole.

546. (Amended) The plate system of claim 538, wherein at least one of said locking elements is at least in part circular.

547. (Amended) The plate system of claim 538, wherein at least one of said locking elements has at least one wedged surface.

548. (Amended) The plate system of claim 538, wherein at least one of said locking elements comprises at least one of a screw and a cap.

549. (Amended) The plate system of claim 538, wherein at least one of said locking elements comprises at least one of a camming surface, a ramped surface, and a threaded portion.

550. (Amended) The plate system of claim 538, wherein at least one of said locking elements does not substantially protrude above said upper surface of said plate.

551. (Amended) The plate system of claim 538, wherein said trailing end of at least one of said bone screws has an upper surface that is at least in part curved.

552. (Amended) The plate system of claim 538, wherein at least one of said bone screws has an upper surface that is at least in part in a plane that crosses the central longitudinal axis of said at least one bone screw, at least one of said locking elements contacting said upper surface of one of said bone screws.

553. (Amended) The plate system of claim 538, wherein the trailing end of at least one of said bone screws is configured to cooperate with at least one of said locking elements to lock said bone screw to said plate.

572. (Amended) The plate system of claim 538, wherein at least a portion of one of said plate, said locking elements, and said bone screws is a bioresorbable material.

573. (Amended) A plate system adapted for use in the anterior human cervical spine for contacting the anterior aspect of at least two cervical vertebral bodies, said plate system comprising:

a plate having a longitudinal axis and a length sufficient to span a disc space and overlap portions of at least two adjacent vertebral bodies, said plate having a lower surface for placement against the vertebral bodies and an upper surface opposite said lower surface, said lower surface of said plate being concave along a substantial portion of the longitudinal axis of said plate;

at least two bone screws each having a central longitudinal axis and being adapted to engage each of the at least two vertebral bodies, respectively, each of said bone screws having a leading end for insertion into the vertebral bodies and a trailing end opposite said leading end, said trailing end having a top

surface oriented toward said upper surface of said plate and a bottom surface opposite said top surface oriented toward said lower surface of said plate;

at least two bone screw receiving holes extending through said plate from said upper surface to said lower surface, at least a first of said bone screw receiving holes adapted to overlie a first of the vertebral bodies and at least a second of said bone screw receiving holes adapted to overlie a second of the vertebral bodies, each of said bone screw receiving holes being configured to prevent said bottom surface of said trailing end of said bone screw from protruding below said lower surface of said plate; and

a plurality of locking elements each adapted to lock to said plate only one each of said bone screws inserted into one each of said bone screw receiving holes, said locking elements each being coaxially engageable at least in part within only one of said bone screw receiving holes to retain said one of said bone screws to said plate, said locking elements each having an outer perimeter contacting at least a portion of the perimeter of one of said bone screw receiving holes, said locking elements each having an upper surface, a lower surface opposite said upper surface, and a through-hole passing through said upper surface and said lower surface, said through-hole having a central longitudinal axis coaxial with a central longitudinal axis of one of said bone screw receiving holes.

578. (Amended) The plate system of claim 577, wherein said access opening is a slot.

580. (Amended) The plate system of claim 573, wherein at least one of said locking elements is generally circular and the central longitudinal axis of said locking

element is the rotational axis of said locking element, the rotational axis being coaxial to the central longitudinal axis of one of said bone screw receiving holes when said locking element is inserted in said bone screw receiving hole.

581. (Amended) The plate system of claim 573, wherein at least one of said locking elements is at least in part circular.

582. (Amended) The plate system of claim 573, wherein at least one of said locking elements has at least one wedged surface.

583. (Amended) The plate system of claim 573, wherein at least one of said locking elements comprises at least one of a screw and a cap.

584. (Amended) The plate system of claim 573, wherein at least one of said locking elements comprises at least one of a camming surface, a ramped surface, and a threaded portion.

585. (Amended) The plate system of claim 573, wherein at least one of said locking elements does not substantially protrude above said upper surface of said plate.

586. (Amended) The plate system of claim 573, wherein said upper surface of said trailing end of at least one of said bone screws is at least in part curved.

587. (Amended) The plate system of claim 573, wherein said upper surface of at least one of said bone screws is at least in part in a plane that crosses the central longitudinal axis of at least one of said bone screws, at least one of said locking elements contacting said upper surface of one of said bone screws.

588. (Amended) The plate system of claim 573, wherein the trailing end of at least one of said bone screws is configured to cooperate with one of said locking elements to lock said bone screw to said plate.

607. (Amended) The plate system of claim 573, wherein at least a portion of one of said plate, said locking elements, and said bone screws is a bioresorbable material.

608. (Amended) A plate system adapted for use in the anterior human cervical spine for contacting the anterior aspect of at least two cervical vertebral bodies, said plate system comprising:

a plate having a longitudinal axis and a length sufficient to span a disc space and overlap portions of at least two adjacent vertebral bodies, said plate having a lower surface for placement against the vertebral bodies and an upper surface opposite said lower surface, said lower surface being concave along a substantial portion of the longitudinal axis of said plate;

at least two bone screws each having a central longitudinal axis and being adapted to engage each of the at least two vertebral bodies, respectively, each of said bone screws having a leading end for insertion into the vertebral body and a trailing end opposite said leading end, at least one of said bone screws including proximate said trailing end a maximum cross sectional dimension transverse to the central longitudinal axis of said bone screw, said bone screw having a contact surface area at the maximum cross sectional dimension;

at least two bone screw receiving holes extending through said plate from said upper surface through said lower surface, each of said bone screw receiving holes having a central longitudinal axis and being adapted to receive one of said bone screws to attach said plate to the vertebral bodies; and

a plurality of locking elements each adapted to lock to said plate only one each of said bone screws inserted into one each of said bone screw receiving holes, said locking elements each adapted to coaxially engage only a respective one of said bone screw receiving holes and to contact said contact surface area of a respective one each of said bone screws so as to retain said respective one of said bone screws to said plate, said locking elements each having an outer perimeter contacting at least a portion of the perimeter of one of said bone screw receiving holes, said locking elements each having an upper surface, a lower surface opposite said upper surface, and a through-hole passing through said upper surface and said lower surface, said through-hole having a central longitudinal axis coaxial with the central longitudinal axis of one of said bone screw receiving holes.

613. (Amended) The plate system of claim 612, wherein said access opening is a slot.

615. (Amended) The plate system of claim 608, wherein at least one of said locking elements is generally circular and the central longitudinal axis of said locking element is the rotational axis of said locking element, the rotational axis being coaxial to the central longitudinal axis of one of said bone screw receiving holes when said locking element is inserted in said bone screw receiving hole.

616. (Amended) The plate system of claim 608, wherein at least one of said locking elements is at least in part circular.

617. (Amended) The plate system of claim 608, wherein at least one of said locking elements has at least one wedged surface.

618. (Amended) The plate system of claim 608, wherein at least one of said locking elements comprises at least one of a screw and a cap.

619. (Amended) The plate system of claim 608, wherein at least one of said locking elements comprises at least one of a camming surface, a ramped surface, and a threaded portion.

620. (Amended) The plate system of claim 608, wherein at least one of said locking elements does not substantially protrude above said upper surface of said plate.

621. (Amended) The plate system of claim 608, wherein said upper surface of said trailing end of at least one of said bone screws is at least in part curved.

622. (Amended) The plate system of claim 608, wherein said upper surface of at least one of said bone screws is at least in part in a plane that crosses the central longitudinal axis of at least one of said bone screws, one of said locking elements contacting said upper surface of one of said bone screws.

623. (Amended) The plate system of claim 608, wherein the trailing end of at least one of said bone screws is configured to cooperate with one of said locking elements to lock said bone screw to said plate.

642. (Amended) The plate system of claim 608, wherein at least a portion of one of said plate, said locking elements, and said bone screws is a bioresorbable material.

643. (Amended) A plate system adapted for use in the anterior human cervical spine for contacting the anterior aspect of at least two cervical vertebral bodies, said plate system comprising:

a plate having a longitudinal axis and a length sufficient to span a disc space and overlap portions of at least two adjacent cervical vertebral bodies, a lower surface for contacting the vertebral bodies and an upper surface opposite said lower surface, said lower surface being concave along a substantial portion of the longitudinal axis of said plate;

at least two bone screws each having a central longitudinal axis and being adapted to engage each of the at least two vertebral bodies, respectively, each of said bone screws having a leading end for insertion into the vertebral bodies and a trailing end opposite said leading end, said trailing end including a lower surface generally transverse to the central longitudinal axis of said screw;

at least two bone screw receiving holes extending through said plate from said upper surface through said lower surface, at least a first of said bone screw receiving holes adapted to overlie a first of the cervical vertebral bodies and at least a second of said bone screw receiving holes adapted to overlie a second of the cervical vertebral bodies, at least one of said bone screw receiving holes having a reduced dimension proximate said lower surface of said plate to form a seat, said seat having a surface being at least in part flat and adapted to contact said lower surface of said trailing end of one of said bone screws; and

a plurality of locking elements each adapted to lock to said plate only one each of said bone screws inserted in one each of said at least two bone screw receiving holes, said locking elements each adapted to coaxially engage only one each of said bone screw receiving holes and to contact at least a portion of only one of said bone screws so as to retain a respective one of said bone

screws to said plate, said locking element each having an outer perimeter contacting at least a portion of the perimeter of one of said bone screw receiving holes, said locking elements each having an upper surface, a lower surface opposite said upper surface, and a through-hole passing through said upper surface and said lower surface, said through-hole having a central longitudinal axis coaxial with a central longitudinal axis of one of said bone screw receiving holes.

648. (Amended) The plate system of claim 647, wherein said access opening is a slot.

649. (Amended) The plate system of claim 643, wherein at least a portion of said lower surface of said plate is roughened to promote the growth of bone along said lower surface of said plate.

650. (Amended) The plate system of claim 643, wherein at least one of said locking elements is generally circular and the central longitudinal axis of said locking element is the rotational axis of said locking element, the rotational axis being coaxial to the central longitudinal axis of one of said bone screw receiving holes when said locking element is inserted in said bone screw receiving hole.

651. (Amended) The plate system of claim 643, wherein at least one of said locking elements is at least in part circular.

652. (Amended) The plate system of claim 643, wherein at least one of said locking elements has at least one wedged surface.

653. (Amended) The plate system of claim 643, wherein at least one of said locking elements comprises at least one of a screw and a cap.

654. (Amended) The plate system of claim 643, wherein at least one of said locking elements comprises at least one of a camming surface, a ramped surface, and a threaded portion.

655. (Amended) The plate system of claim 643, wherein at least one of said locking elements does not substantially protrude above said upper surface of said plate.

656. (Amended) The plate system of claim 643, wherein said upper surface of said trailing end of at least one of said bone screws is at least in part curved.

657. (Amended) The plate system of claim 643, wherein said upper surface of at least one of said bone screws is at least in part in a plane that crosses the central longitudinal axis of at least one of said bone screws, at least one of said locking elements contacting said upper surface of one of said bone screws.

658. (Amended) The plate system of claim 643, wherein the trailing end of at least one of said bone screws is configured to cooperate with one of said locking elements to lock said bone screw to said plate.

673. The plate system of claim 670, wherein said bone growth promoting material includes at least one of bone morphogenetic protein, hydroxyapatite, and hydroxyapatite tricalcium phosphate.

674. (Amended) The plate system of claim 643, wherein at least a portion of said lower surface of said plate comprises a bone ingrowth material.

677. (Amended) The plate system of claim 643, wherein at least a portion of one of said plate, said locking elements, and said bone screws is a bioresorbable material.

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678. (Amended) A plate system adapted for use in the anterior human cervical spine for contacting the anterior aspect of at least two cervical vertebral bodies, said plate system comprising:

a plate having a longitudinal axis and a length sufficient to span a disc space and overlap portions of at least two adjacent vertebral bodies, said plate having a lower surface for placement against the vertebral bodies and an upper surface opposite said lower surface, said lower surface of said plate being concave along a substantial portion of the longitudinal axis of said plate;

at least two bone screws each having a central longitudinal axis and being adapted to engage each of the at least two vertebral bodies, respectively, each of said bone screws having a leading end for insertion into the vertebral bodies and a trailing end opposite said leading end, said trailing end having a top surface oriented toward said upper surface of said plate and a bottom surface opposite said top surface oriented toward said lower surface of said plate;

at least two bone screw receiving holes extending through said plate from said upper surface to said lower surface, at least a first of said bone screw receiving holes adapted to overlie a first of the vertebral bodies and at least a second of said bone screw receiving holes adapted to overlie a second of the vertebral bodies, each of said bone screw receiving holes being configured to prevent said bottom surface of said trailing end of said bone screw from protruding below said lower surface of said plate; and

a plurality of locking elements each adapted to lock to said plate only one each of said bone screws inserted into one each of said bone screw receiving

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holes, said locking elements each having a central longitudinal axis that passes through one of said bone screw receiving holes, respectively, to retain said one of said bone screws to said plate, said locking element each having an outer perimeter contacting at least a portion of the perimeter of one of said bone screw receiving holes, said locking elements each having an upper surface, a lower surface opposite said upper surface, and a through-hole passing through said upper surface and said lower surface, said through-hole having a central longitudinal axis coaxial with a central longitudinal axis of one of said bone screw receiving holes.

683. (Amended) The plate system of claim 682, wherein said access opening is a slot.

685. (Amended) The plate system of claim 678, wherein at least one of said locking elements is generally circular and the central longitudinal axis of said locking element is the rotational axis of said locking element, the rotational axis being coaxial to the central longitudinal axis of one of said bone screw receiving holes when said locking element is inserted in said bone screw receiving hole.

686. (Amended) The plate system of claim 678, wherein at least one of said locking elements is at least in part circular.

687. (Amended) The plate system of claim 678, wherein at least one of said locking elements has at least one wedged surface.

688. (Amended) The plate system of claim 678, wherein at least one of said locking elements comprises at least one of a screw and a cap.

689. (Amended) The plate system of claim 678, wherein at least one of said locking elements comprises at least one of a camming surface, a ramped surface, and a threaded portion.

690. (Amended) The plate system of claim 678, wherein at least one of said locking elements does not substantially protrude above said upper surface of said plate.

691. (Amended) The plate system of claim 678, wherein said upper surface of said trailing end of at least one of said bone screws is at least in part curved.

692. (Amended) The plate system of claim 678, wherein said upper surface of at least one of said bone screws is at least in part in a plane that crosses the central longitudinal axis of at least one of said bone screws, said locking elements contacting said upper surface of one of said bone screws.

693. (Amended) The plate system of claim 678, wherein the trailing end of at least one of said bone screws is configured to cooperate with one of said locking elements to lock said bone screw to said plate.

712. (Amended) The plate system of claim 678, wherein at least a portion of one of said plate, said locking elements, and said bone screws is a bioresorbable material.

713. (Amended) A plate system adapted for use in the anterior human cervical spine for contacting the anterior aspect of at least two cervical vertebral bodies, said plate system comprising:

a plate having a longitudinal axis and a length sufficient to span a disc space and overlap portions of at least two adjacent cervical vertebral bodies, a lower surface for placement against the cervical vertebral bodies, said lower

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surface being concave along a substantial portion of the longitudinal axis of said plate, and an upper surface opposite said lower surface;

at least two bone screws each having a central longitudinal axis and being adapted to engage each of the at least two cervical vertebral bodies, respectively, each of said bone screws having a leading end for insertion into the cervical spine and a trailing end opposite said leading end, at least one of said bone screws including proximate said trailing end a contact surface area at least in part in a plane that crosses the central longitudinal axis of said bone screw;

at least two bone screw receiving holes extending through said plate from said upper surface through said lower surface, at least a first of said bone screw receiving holes adapted to overlie a first of the cervical vertebral bodies and at least a second of said bone screw receiving holes adapted to overlie a second of the cervical vertebral bodies, each of said bone screw receiving holes having a central longitudinal axis and being adapted to receive one of said bone screws to attach said plate to the cervical spine; and

a plurality of locking elements each adapted to lock to said plate only one each of said bone screws inserted in one each of said bone screw receiving holes, said locking elements each contacting said contact surface area of only one of said bone screws so as to retain said one of said bone screws to said plate, said locking element contacting said contact surface without penetrating said bone screw.

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718. (Amended) The plate system of claim 717, wherein said access opening is a slot.

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720. (Amended) The plate system of claim 713, wherein at least one of said locking elements is generally circular and the central longitudinal axis of said locking element is the rotational axis of said locking element, the rotational axis being coaxial to the central longitudinal axis of one of said bone screw receiving holes when said locking element is inserted in said bone screw receiving hole.

721. (Amended) The plate system of claim 713, wherein at least one of said locking elements is at least in part circular.

722. (Amended) The plate system of claim 713, wherein at least one of said locking elements has at least one wedged surface.

723. (Amended) The plate system of claim 713, wherein at least one of said locking elements comprises at least one of a screw and a cap.

724. (Amended) The plate system of claim 713, wherein at least one of said locking elements comprises at least one of a camming surface, a ramped surface, and a threaded portion.

725. (Amended) The plate system of claim 713, wherein at least one of said locking elements does not substantially protrude above said upper surface of said plate.

726. (Amended) The plate system of claim 713, wherein said upper surface of said trailing end of at least one of said bone screws is at least in part curved.

727. (Amended) The plate system of claim 713, wherein said upper surface of at least one of said bone screws is at least in part in a plane that crosses the longitudinal axis of at least one of said bone screws, said locking elements contacting said upper surface of one of said bone screws.

728. (Amended) The plate system of claim 713, wherein said contact surface area of at least one of said bone screws is at least in part in a plane that is perpendicular to the central longitudinal axis of said bone screw.

729. (Amended) The plate system of claim 713, wherein said contact surface area of at least one of said bone screws is at least in part arcuate.

730. (Amended) The plate system of claim 713, wherein said contact surface area of at least one of said bone screws is at least in part flat.

731. (Amended) The plate system of claim 713, wherein said contact surface area of at least one of said bone screws is at least in part at an angle to the central longitudinal axis of said bone screw.

732. (Amended) The plate system of claim 713, wherein the trailing end of at least one of said bone screws is configured to cooperate with one of said locking elements to lock said bone screw to said plate.

751. (Amended) The plate system of claim 713, wherein at least a portion of one of said plate, said locking elements, and said bone screws is a bioresorbable material.

REMARKS

Applicant has amended claims 282, 285-287, 538, 543, 545-553, 572, 573, 578, 580-588, 607, 608, 613, 615-623, 642, 643, 648-658, 673, 674, 677, 678, 683, 685-693, 712, 713, 718, 720-732, and 751 to further define Applicant's claimed invention.

Applicant submits that all of the pending claims are patentable over the art of record.